

LISTING OF THE CLAIMS

1. (withdrawn) A rotary blood pump for use in a heart assist device or like device, said pump having an impeller suspended in use within a pump housing exclusively by hydrodynamic thrust forces generated by relative movement of said impeller with respect to and within said pump housing.

2-4. (canceled)

5. (currently amended) A blood pump including: a housing; an at least partially hydrodynamically suspended impeller; wherein said impeller is located within said housing and includes a plurality of magnets and wherein each said magnet is arranged within a circular zone which is generally near to the maximum radius of the said impeller, said impeller including vanes, The pump of claim 3, wherein said vanes are generally shark fin shaped.

6. (currently amended) A blood pump including: a housing; an at least partially hydrodynamically suspended impeller; wherein said impeller is located within said housing and includes a plurality of magnets and wherein each said magnet is arranged within a circular zone which is generally near to the maximum radius of the said impeller, said impeller including vanes, The pump of claim 3, wherein said vanes are generally tear-dropped tear drop shaped.

7-22. (canceled)

23. (currently Amended) A rotary blood pump including: a pump housing, wherein said housing includes an inlet and an outlet; an impeller, wherein said impeller is rotatably arranged within said housing and said impeller, and when in use, is urged to rotate by an electric motor; said ~~electric motor, which includes~~ said electric motor including a plurality of electric coils mounted on, in or about said housing and a plurality of magnets included within the impeller, wherein said impeller includes at least three blades having faces, wherein said blades include ~~impeller includes~~ hydrodynamic lifting ~~surfaces. surfaces on said faces of said blades, said hydrodynamic lifting surfaces including a taper.~~

24-26: (canceled)

27. (currently amended) The pump of claim 23, wherein said blades of said impeller are of generally triangular configuration, wherein ~~the blade width increases~~

widths of the blades increase with increasing radius and wherein the blades have a convex outer surface on the circular border of a supporting body.

28. (New) A blood pump comprising:
a pump housing having an inner surface;
an impeller having an axis of rotation and a plurality of blades, each of said blades having a first face facing said inner surface of said pump housing,
each said first face including a deformed surface thereon, each said deformed surface including a taper,
each said deformed surface forming a wedge-shaped restriction between each said blade and said inner surface of said pump housing,
wherein fluid passing through each said wedge-shaped restriction generates a force in a direction substantially parallel to said axis of rotation.

29. (new) The blood pump of claim 28 wherein said deformed surface forms less than all of said first face.

30. (new) The blood pump of claim 28 wherein said deformed surface further includes a step.

31. (new) The blood pump of claim 28 wherein said deformed surface further includes a step in an edge of said blade.

32. (new) The blood pump of claim 28 wherein said force is operative to force said impeller toward a center of said pump housing.

33. (new) The blood pump of claim 28 wherein said force increases with decreasing distance between said first face of each said blade and said inner surface.

34. (new) The blood pump of claim 28 wherein said force increases more than linearly with decreasing distance between said first face and a surface facing said first face.

35. (new) The blood pump of claim 28 wherein said deformed surface forms at least a part of said first face of each said blade.

36. (new) The blood pump of claim 28 wherein said deformed surface occupies less than all of said first face of each said blade.

37. (new) The blood pump of claim 28 wherein when said impeller is substantially centered within said pump housing, a gap of about 100 microns separates said first face of each said blade from said inner surface of said pump housing.

38. (new) The blood pump of claim 28 wherein each of said blades includes at least one curvilinear edge and at least two substantially linear edges, a first of said substantially linear edges having a first length and a second of said substantially linear edges having a second length, said second length being greater than said first length.

39. (new) The blood pump of claim 38 wherein for a first blade and a second blade that are adjacent, a first edge of said first blade having said first length is adjacent a second edge of said second blade having said second length.

40. (new) The blood pump of claim 28 wherein said first face of each said blade includes only one said deformed surface.

41. (new) The blood pump of claim 40 wherein said first face of each said blade includes only one said taper.

42. (new) A blood pump having an impeller, the impeller having a plurality of blades, each said blade having at least two substantially linear edges, a first of said edges having a first length, and a second of said edges having a second length, the first length being less than the second length.

43. (new) The blood pump of claim 42 wherein for a first blade and a second blade that are adjacent, a first edge of said first blade having said first length is closer to a second edge of said second blade having said second length than to a first edge of said second blade having said first length.

44. (new) The blood pump of claim 43 wherein neither of the two substantially linear edges is along a periphery of the impeller.

45. (new) The blood pump according to claim 42 wherein the blades are separated by grooves and wherein material disposed within said grooves forms an incline.

46. (new) The blood pump of claim 39 wherein said first edge and said second edge are along a periphery of the blade.

47. (new) The blood pump of claim 43 wherein said substantially linear edges are along a periphery of the blade.